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Determinants of Mobile Banking Adoption at Commercial Bank of Ethiopia in Case of Bako District

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ABSTRACT

The article investigates the factors affecting customers' adoption decision of mobile banking in Bako Tibe, Ethiopia. The continuous expansion of technological innovations especially in the banking sector have stirred competition which has changed the way businesses operate resulting in the introduction of mobile banking. This is illustrated that Ethiopia is recently expanding the use of internet banking such as mobile banking. To analysis of the determinants of mobile banking adoption in Bako Tibe, open and semi-structured questionnaires were used. The results of binary logit model indicates that quality of internet, lack of awareness, relative advantage, awareness, trial ability, experience, gender, education, income and age are the factors that are significantly influencing customers' adoption decisions of mobile banking at Commercial Bank of Ethiopia. The conclusion is that commercial bank of Ethiopia invests massively in mobile banking and other information technology innovations in order to further promote efficient service delivery and increase adoption of mobile banking services.

Key words: Mobile banking; adoption; logistic regressions; experience; awareness; experience.

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1. INTRODUCTION

Mobile banking system is new development in Ethiopian Banking industry. Recently, mobile banking services are being used with increasing frequency in Ethiopia. The adoption of mobile banking (M-banking) began to occur quite extensively as a channel of distribution for financial services due to rapid advances in the banking market. Mobile banking offers numerous benefits to both banks and customers (Allen et al, 2001). Mobile banking dates back to the end of the 1990s when the German company Paybox, in collaboration with Deutsche Bank,launched the first service. Among developing countries, Kenya was the first to introduce a text-based mbanking service, M-Pesa, in 2007. By 2012, there were more than seven million registered M-Pesa users in Kenya.

Mobile banking today is most often performed via SMS or the mobile internet but can also use special program that clients download to their mobile devices. The services offered by mobile banking include getting account information, transferring funds, sending check books request, managing deposits, checking transaction and so on. Mobile banking is likely to have significant effects on the market (Safeena et al., 2012). Despite such benefits, the use of mobile phones or tablets to conduct banking transactions or access financial informationis is not as widespread as might be expected (e.g., Dineshwar and Steven, 2013; Luarn and Lin, 2005; Shih et al., 2010). Juniper Research (2013) has revealed that more than 1 billion people are expected to use m-banking globally by 2017, but that level represents only 15% of the global mobile subscription base- a base that accounts for approximately 96% of the world's population.

A prior study on merchants' adoption of mobile payments identified high costs and complexity of systems as two barriers (Mallat & Tuunainen, 2008). Merchants offering mobile payment services expect transactions to be faster and that investment and cost of usage should be low or free (Mallat, 2008; Oh et al., 2006; Ondrus & Pigneur, 2006; Dahlberg et al., 2008; Carr, 2007). Merchants also expect real-time status of transactions, gain competitive advantages, high security and trust in the mobile payment products and services that merchants provide for its customers (Mallat, 2007; Zarrabi et al., 2015; Karnouskos&Fokus, 2004).

Banking in Ethiopia faces numerous challenges to fully adopt mobile banking application and seize the opportunities presented by ICT applications in general. Part of key challenges for Mobile banking applications are low level of internet penetration and poorly developed telecommunication infrastructure, lack of infrastructure for telecommunications, lack of suitable legal and regulatory framework for e-commerce and e-payment, high rate of illiteracy, high cost of internet, absences of financial institutions networks that link different banks, frequent power interruption, resistance to changes in technology among customers and staff due to lack of awareness on the benefits of new technologies, fear of risk, lack of trained personnel in key areas



(Gardachew, 2010; Laforet S, 2005; Luarn P, Lin HH, 2005; Zhou T, Lu Y, Wang B, 2010).

According to the National Bank of Ethiopia (NBE) annual report (2013/14) 2,208 bank branches are available for around 90 million people. Developed countries have 89 percent of the adult population with bank account whereas in Africa only 23 percent of the adult populations own bank account (ADB, 2013) or 20 percent at family level. As, compared to other African countries, the level of adoption in Ethiopia is very low. For instance Commercial Bank of Ethiopia, the pioneer bank in mobile banking adoption, has very low users. From the total number of account holders (15.9 million) only 1.4 million customers are active mobile banking users as annual report of September 28/2017.

In Ethiopia the number of mobile phone subscribers has now reached more than 38 million in year of July 07, 2015 as per unpublished annual performance report of ethio telecom. Hence, mobile banking is an opportunity for the banks in Ethiopia to address the potential market in the country where access to banking services is very low. Some researches have been conducted in Ethiopia to identify factors that affect mobile banking adoption at commercial bank of Ethiopia, such as Werku Mulualem (2015), kalkidan Gezahegn (2016), Laekemariam Haile (2015), with no attention paid to the determinants of mobile banking adoption from the merchants perspective. And all of these studies showed varying results and this study therefore will intend to fill this gap.

The overall objective of the study is to elicit merchants perception and adoption of mobile banking at Commercial Bank of Ethiopia, Bako district, Bako and Lega Kella branches.

The study also has the following specific objectives. It tried to:

- Examine the perception of respondents about the awareness, ease of use, complexity, compatibility, self-efficacy, perceived trust, experience, trialability, education, income, age, gender, relative advantage and perceived risk of mobile banking.
- Asses the determinants of mobile banking adoption

Conceptual Framework

A study conducted by Alagheband [Alagheband P (2006)] to identify factors affecting the adoption of mobile banking services indicated that men represent the segment with the highest use of Mobile banking. Studies discovered that gender has strong effects on the adoption level of mobile-banking applications in which males have greater probability of adopting as compared to females (Alafeef M, Singh D, Ahmad K, 2011; Muzividzi D, Mbizi R, Mukwazhe T, 2013).

A study conducted by Abenet Y (2010), Poon WC (2008) and Azouzi D (2009) on the mobile banking adoption in Ethiopia showed that the young age group is more computer literate and finds it easy to accept and use new technologies. The hypothesis tested to diagnose the relationship between age and e-banking preference by Yitbarek T, Zeleke S (2013) shows a gradual but steady decline in the percentage preference of mobile-banking as the age group increases. Izogo EE, Nnaemeka OC, Onuoha OA, Ezema KS (2012) and Alafeef M, Singh D, Ahmad K (2011) found that age has significant effect on customers' adoption mobile banking. It implies that young and more educated peoples are better in their adoption of e-banking as compared to their counter parts. In addition, the study by Margaret M, Ngoma MF (2013) shows that the young generation is more familiar with computer and internet, so they are more interested in using the mobile banking system.

Studies by Poon WC (2008) and Ismail MA, Osman MA (2012) showed that high income clients and those who have current account and computer and internet literate are more likely to use mobile-banking services. Similarly, Annin K, Adjepong OM, Senya SS (2013) clearly indicate that monthly income level is among the socio-economic factors that significantly influence customers' decision to use mobile banking. A study conducted by Abenet Y (2010) in Ethiopia found that mobile banking practice is greater among those peoples who are in a better educational level, so educational level has positive impact on mobile banking adoption. This finding is in line with Edwin MA, Ailemen IO, Okpara A, Mike OA (2014).

Further a study conducted by Izogo EE, Nnaemeka OC, Onuoha OA, Ezema KS (2012), Alafeef M, Singh D, Ahmad K (2011) and Margaret M, Ngoma MF (2013) using Chi-Square test discovered that the education level is the strongest positive factor that influences the adoption level of mobile banking. Tater B, Tanwar M, Murari K (2011) identified that customers with post-graduate and graduate qualifications are mostly adaptors of mobile banking services.

The following Hypothesis were formulated from the above conceptual framwork.

H1: Perceived Ease of Use has positive significant relationship with mobile banking adoption.

H2: Perceived Risks have negative and significant relationship with mobile banking adoption..



- H3: Relative Advantages have positive significant relationship towards mobile banking adoption.
- H4: here is significant mobile banking adoption behavior difference between males and females.
- H5: There is significant mobile banking adoption behavior difference between customers' who are in different age .
- H6: There is significant mobile banking adoption behavior difference between customers' who are in different income categories.
- H7: There is a significant mobile banking adoption behavior difference between customers who are in different educational level.
- H8: Awareness has a significant positive impact on mobile banking adoption.
- H9: Compatibility has a significant positive impact on customers adoption of mobile banking. H10: Self-efficacy has positive impact on mobile banking adoption.
- H11: Experience has a significant positive impact on adoption of mobile banking services.

Related literature

Studies have been conducted in various countries to better understand customer's attitudes toward this emerging mobile technology. For example, Wessels and Drennan (2010) conducted a study to identify and test the key factors stimulating and hindering the adoption of mobile banking, as well as the effect of user's attitude on the intention of use. They found out that perceived usefulness, perceived risk, cost, and compatibility have significant effect on the adoption of mobile banking. Koenig-Lewis et al. (2010) conducted a study on predicting the continuation of the use of mobile banking services by young users in England, aiming at investigation of barriers of mobile banking adoption and found that revealed that compatibility, perceived usefulness, and risk are significant factors affecting the adoption of mobile banking. A study by (Sripalawat et al. 2011) examined positive and negative factors affecting mobile banking acceptance in Thailand. Subjective norms, perceived usefulness, perceived ease of use, were considered as the positive factors, and device barrier, perceived risk, lack of information, and perceived financial cost as the negative factors.

Dinesh war and Steven (2013), the researchers investigated the complex factors that prevent customers from adopting mobile banking services in Mauritius revealed that age, gender and salary had no influence on adoption but rather, convenience, compatibility and banking needs influenced banking adoption. The study conducted on factors that affect Isfahanian Mobile Banking Adoption in Iran by Kazemi, S.A., et al (2013) suggested that factors such as perceived usefulness, perceived ease of use, compatibility and trust have an influence on behavioral attitude to adopt mobile banking.

Worku mulualem (2015) and Kalkidan Gezahegn (2016) using multiple regression analysis, in Addis Ababa, and concluded that perceived usefulness and perceived ease of use, compatibility and relative advantage have a positive relationship with the adoption of mobile banking technology. And perceived risk and perceived trust have a negative relationship with adoption of mobile banking technology. Laeke Mariam Haile (2015) investigated factors affecting the adoption of mobile banking in commercial bank of Ethiopia using unified theory of acceptance and use of technology (UTAUT) concluded that effort expectancy, performance expectancy and trust were found to have positive and significant influence on mobile banking adoption. how ever perceived risk and perceived cost have negative influence on mobile banking adoption.

MATERIALS AND METHODS

This study employed a quantitative research approach by using a primary data source. A questionnaire was designed for the sample merchant customers of Commercial Bank of Ethiopia Bako and Lega Kela branches. The sampling design that would be applied for the research is simple random sampling. There are total of 1023 merchant customers in these two branches. The sample size that would be required for the study would be determined or calculated using the following samplesize formula.

$$n = N/(1 + N(E2))$$

Where: N = the population size, n = sample size e = the level of precision or accuracy.

$$n = \frac{1023}{1 + 1023(e)^2} = 281.096 \approx 281$$
: $e = 0.05$



Description of the Study Area

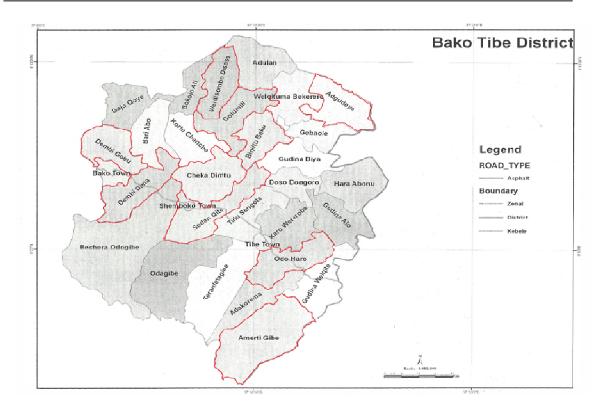
Bako Tibe district is found in West Shewa Administrative Zone, Oromia Regional State, about 250 km west of Addis Ababa, at latitude of 9.12° and at a longitude of 37.05°. Bako Tibe District is with an area of about 644.7 km² of which about 54.25% ha is under crop, about 23.98% ha is under pasture, about 5.12%ha is under forest and about 16.65% ha is for Infrastructure or for other uses. The district borders East Wollega in The West, Horro Guduru Wollega in North, Chaliya District in the East and Biloboshe district (East Wollega zone) in the south. Government and community owned forests are also available. The district's population was estimated to be 133,799 of which 21.15% was urban and 78.85% lives in rural areas. The age groups 0 -14 years, 15-64 years and above 64 years constituted 42.2%, 52.3% and 4.0% of the population, respectively (CSA, 2016) . Rivers in the district include Gibe, Robi, Abuko, Mara and other 7 Major rivers as well as several seasonal streams are flowing through the district. There is no lake in the district. Rendzinas, Haplic and Luvic phaeozems (4.0%), chromic and Orphic Luvisols (14.9%), Dystric Nitosols (60.2%), and Chromic and Pellic Vertisols (20.9%) are the major soil types found in the district.

High forest, woodland, riverine, shrub and bush, savanna and manmade forests are available in Bako Tibe District. According to Bako District Agricultural Office (2017) there are about 127,615 cattle, 3,438 sheep, 11,600 goats, 9,709 horses, 9,200 donkeys, 4,668 mules and 8,033 Poultry in the district. Climatically, the district is classified into dega (12%), woinadega (35%) and lowland (53%) zones. Most of the areas in the district range in altitude between 1600 m.a.s.l. and 2870 m.a.s.l. The vast area of the district receives rainfall between 1000 mm and 1500 mm. The annual mean temperature ranges between 13.2 °c - 32°c. The area receives maximum rainfall in the months of July and August. There are four government and private Technical and vocational colleges, there are two secondary and preparatory schools, there are a number of elementary and junior secondary schools, there are a number of kindergarten schools as well. Educational coverage reached about 87% as of Bako Tibe District office of Education, 2013. Besides there is 24 hours serving hydropower electricity source, digital telecommunication service, Ethiopian commercial Bank, Awash International Bank and Oromia International Bank in Bako Tibe District are some of financial institutions...such as Oromia Credit and Loan Association.

FIGURE 1: MAP OF BAKO TIBE DISTRICT







DISCUSSION

Descripitive and Inferential analysis

Descriptive statistics such as Mean and t-value were used to assess the demographic profile of the respondents to make the analysis more meaningful, clear and easily interpretable. Descriptive statistics allow the researchers to present the data acquired in a structured, accurate and summarized manner.

The result of the survey indicated that out of the total sampled merchant customers 41.5 and 58.5 percents adopter and non adopter are female and only about 61.7 and 38.3 percents adopter and non adopter are male respectively. Gender of merchant customers was hypothesized to be one of the variables that make a significant difference on the level of adoption. The survey result showed significant difference (t=10.8525) on adoption of mobile banking in terms of merchant customers gender. Previous research showed that gender differences have shown to exist in technology acceptance (Venkatesh & Davis, 2000; Wolin & Korganmkar, 2003; Gefen &Straudb, 1997). Wolin and Korganmkar (2003) found that males and females differ significantly in several dimensions with males exhibiting more positive beliefs and attitudes about E-commerce than females. Mean age of adopters of mobile banking and non adopters is 28.15 and 37.82 respectively.

The mean customer income of mobile banking adopter and non adopter was 9401.97 and 4188.37 birr respectively. The overall mean of income for both adopter and non adopter was birr 7008.54. The mean difference between mobile banking adopter and non adopter merchant customers shows statistically significant at 10 % significance level (t= - 5.4181), and indicating that as customers income increases a probability of customer to be mobile banking adopter also increases. High income clients and those who have current account and computer and internet literate are more likely to use Mobile-banking services (Poon, 2008; Annin K, Adjepong OM, Senya SS, 2013). The result shows that the mean educational level of adopter and non adopter merchant customers is approximately grade 10.(9.79) and gradesix(6.05 respectively. The t-test showed significant relationship between educational level of merchant customers and adoption of mobile banking.

Econometric results and analysis

The dependent variable is a binary outcome which takes a value of one if the respondent is using Mobile banking and zero otherwise. Therefore, binary logit model is used to identify potential determinants of the adoption of mobile banking. The likelihood ratio has a chi-square distribution and it is used for assessing the significance of logistic regression. The result is significant at less than one percent probability level revealing that there is association between dependent and independent variables. The model output revealed that age and awarenes



were found significant at less than one percent probability level. Gender, income, education, relative advantage, trial ability and experience were found to be significant at 5 percent probability level.

Interpretation of Significant Variables: Binary logit output shows that age of merchant customers shows a negative and significant effect on the adoption of mobile banking at less than 1% significance level. The negative sign of the coefficient indicates that, other things remain constant, when customers' age increases by 1 year, the probability of customers becoming mobile banking adopter decreases by 4.2% from the base line mark (32.5943). The possible explanation for this may be because young age group is more computer literate and finds it easy to accept and use new technologies. This is supported by studies by Poon WC (2008) and Azouzi D (2009). The hypothesis tested to diagnose the relationship between age and e-banking preference by Yitbarek et al. (2013) shows a gradual but steady decline in thepercentage preference of e-banking as the age group increases.

Binary logit result shows that gender, income, trial ability, experience and relative advantage of were significant at 5% significance level and positively related with adoption of mobile banking. Other things remain constant; the probability of adoption of male merchant customers is higher by 30 percent than female merchant customers. This evidence is supported by the findings of Alafeef M, Singh D, Ahmad K (2011). The positive sign of the coefficient on income indicates that, other things remaining constant, when customers earnings increases by 1 Birr, the probability of customers becoming mobile banking adopter increase by 0.00416 percent from the base line mark (7008.54). The result of this study is in line with the finding of, Ismail MA, Osman MA (2012)] on their study of investigated that e-banking use is associated with clients' income, account type, and computer and internet literacy.

The positive sign of the coefficient on education indicates that, other things remain constant, when customers level of education increases by 1 year, the probability of customers becoming mobile banking adopter increase by 4.985 percent from the base line mark (8.07829). Educated persons can easily understand the risk associated with mobile banking usage and can secure the security of his acount. This in turn increases mobile banking adoption and make merchant customers tobe mobile banking adopters (Abenet Y, 2010; Edwin MA, Ailemen IO, Okpara A, Mike OA, 2014). People who have more experience using similar system are more relying on instrumental basis rather than social basis because experience users of mobile devices or wireless internet are more skillful and easy to use M-commerce (kim, 2005, Venkatesh et al., 2003).

Further a study conducted by Izogo EE, Nnaemeka OC, Onuoha OA, Ezema KS (2012), Alafeef M, Singh D, Ahmad K (2011) and Margaret M, Ngoma MF (2013) concerning the impact of demographic factors on e-banking adoption among bank customers using Chi-Square Test found that educational status has significant effect on customers' adoption and usage of e-banking. They discovered that the education level is the strongest positive factor that influences the adoption level of e-banking whereby the younger generations are highly educated. In line with this Tater B, Tanwar M, Murari K (2011) on their study identified that customers with post-graduate and graduate qualifications are mostly adaptors of Mobile banking services.

Furthermore, there is significant relationship between awareness and mobile banking adoption. The possible justification for this finding is that merchant customers who are aware of about availability of mobile banking and its advantage and disadvantage have higher probability to adopt mobile banking technology than those who are not aware of about mobile banking. This was also confirmed by prior research of (Laforet and Li 2005) that indicated awareness to significantly influence customer's usage of online and mobile banking. Similarly, merchant customers get trial demo first the probbablity of adoption will be high. This was also confirmed by prior research of (Tan and Toe (2000) assert that if given the opportunity to evaluate innovation, customer minimize the particular concerns of the unknown, which led to acceptance.

CONCLUSION

This study examined some empirical evidence about factor affecting mobile banking adoption intention at commercial bank of Ethiopia. A proposed research framework was established on the basis of relevant literature review and was found that awareness, experience, trial ability age, gender, education, income and relative advantage are having a significant impact on m-banking adoption intention of merchant customers. The variable gender has major effect on merchant customers mobile banking adoption, followed by awareness, relative advantage, trial ability, experience, education, income and age . Except age, all factors have a positive effect on mobile banking adoption behavior.

Income of merchant customers shows a positive and significant effect on the adoption of mobile banking. The result of this study is in line with the finding of Ismail MA, Osman MA (2012) which investigated that mobile banking usage is associated with clients' income, account type, and computer and internet literacy. Education



has positive and significant impacts on mobile banking adoption of merchant customers. The result of this study is in line with the findings of Abenet Y (2010) in Ethiopia which found that mobile banking usage practice is greater among those peoples who are in a better educational level as compared to others, so educational level has positive impact on e-banking adoption. Further a study conducted by Izogo EE, Nnaemeka OC, Onuoha OA, Ezema KS (2012), Alafeef M, Singh D, Ahmad K (2011) and Margaret M, Ngoma MF (2013) concerning the impact of demographic factors on e-banking adoption among bank customers found that relative advantage, awareness, experience, trial ability were found to have a positive and statistically significant effect on adoption of mobile banking.

Now-a-days due to technology convergence mobile-banking is replaced by m-banking and increasing growth in wireless phone users indicates bright future of m-banking in Ethiopia. Mobile banking helps banks to reduce its service delivery cost and also reduces transaction cost, reduces manpower and cost of banking services which leads to high turnover and net profit. Consumers get prompt services in minimum cost by using m-banking. However, awareness is a major concern of consumers while using mobile banking, bank can reduce this issue by introducing arranging different awareness program. Commercial Bank should use social media as tool to make them aware about mobile banking services.

Mobile banking system is new development in Ethiopian Banking industry. As a result the central bank should issue suitable legal frameworks to ease the adoption of mobile banking system and government and private sectors should support banking sector by facilitating development of sufficient ICT infrastructure for the successful implementation of mobile banking adoption system. Besides, banks should consider technology based competition focusing on, customer expansion, cost reduction and awareness creations and should work towards creating awareness of the community and their employees towards the processes and benefits of the mobile banking system to exploit the benefits.

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